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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/016,624	12/10/2001	David G. Wang	9926 (NCRC-0057-US)	4094

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EXAMINER

PATEL, NIHIR B

ART UNIT PAPER NUMBER

3743

DATE MAILED: 12/02/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/016,624

Applicant(s)

WANG ET AL.

Examiner

Nihir Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on September 22nd, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 6-10, 16, 20, 22, 23 and 27-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-15, 17-19, 21 and 24-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Figure(s) 1 and 2 in Paper No. 8 is acknowledged. The examiner agrees that figure 1 is prior art, but still believes that figure(s) 2, figure(s) 3, 4, and 5, and figure(s) 6 are different embodiments. The applicant argues that the specifications state "the heat pipe shown in figure 3 are embedded in the heat sink block 120 of figure 4, however the specifications also states "A similar arrangement can be used for the remote heat sink 108 where heat pipe 110 coincide with heat pipes 107" and "in the illustrated embodiment, the portions 110A and 110B are generally perpendicular to each other" which in view of the examiner makes figure(s) 2 and figure(s) 3 and 4 different embodiment. Therefore, the requirement is still deemed proper and is therefore made FINAL.

Claims 6-10, 16, 20, 22, 23, and 27-39 (figure(s) 3, 4, and 5) are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 8.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hileman et al. US Patent No. 6,144,553. Hileman discloses a refrigeration cooled disk storage assembly that

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comprises a heat conduit 110 (figure 5; column 4 lines 30-35); and a block 130 (see figure 5; column 4 lines (23-30) formed of a thermally conductive material having a first thermal conductivity (aluminum), the heat conduit 110 extending through a substantially portion of the block 130, the heat conduit 110 having a second thermal conductivity (copper) greater than the first conductivity (aluminum).

Referring to claim 4, Hileman discloses an apparatus wherein the heat conduit 110 is adapted to transfer heat from a heat source along its length (see column 4 lines 39-45).

Referring to claim 5, Hileman discloses an apparatus wherein the block 130 is adapted to transfer heat away from the heat conduit 110 (see column 4 lines 39-45).

Referring to claim 14, Hileman discloses an apparatus wherein the heat conduit comprises a heat pipe 110 (see figure 5 and column 4 lines 30-35).

Referring to claim 15, Hileman discloses an apparatus wherein the heat conduit 110 comprises a tubular structure having a bore through which fluid is adapted to flow to transfer heat (see figure 5 and column 4 lines 30-35).

Referring to claim 24, Hileman discloses a refrigeration cooled disk storage assembly that comprises a block 130 formed of a thermally conductive material having a first thermal conductivity (aluminum); and extending an elongated heat conduit 110 through a substantial portion of the block 130, the elongated heat conduit 110 having a second thermal conductivity (copper) greater than the first thermal conductivity (aluminum).

Referring to claim 25, Hileman discloses an apparatus wherein the elongated heat conduit 110 comprises extending a heat pipe (see figure 5 and column 4 lines 30-35).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11, 17, 18, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hileman et al. US Patent No. 6,144,553 in view of Suzuki US Patent No. 6,152,213.

Referring to claim 11, Hileman discloses the applicant's invention as claimed with the exception of providing a block with airflow channels to provide surfaces on the block exposed to airflow.

Suzuki discloses a cooling system for electronic packages that does provide a block with airflow channels to provide surfaces on the block exposed to airflow (see figures 15a, 15b, and 15c). Therefore it would be obvious to modify Hileman's invention by providing a block with airflow channels to provide surfaces on the block exposed to airflow in order to increase the cooling process.

Referring to claim 17, Hileman discloses the applicant's invention as claimed with the exception of providing a heat conduit that has a first portion and a second portion angled with respect to the first portion, the first portion adapted to contact a surface of a heat source.

Suzuki discloses a cooling system for electronic packages that does provide a heat conduit that has a first portion and a second portion angled with respect to the first portion, the first portion adapted to contact a surface of a heat source (see figure 2). Therefore it would be obvious to modify Hileman's invention by providing a heat conduit that has a first portion and a

second portion angled with respect to the first portion, the first portion adapted to contact a surface of a heat source in order to make it easier to relocate the position of the heat sink.

Referring to claim 18, Hileman discloses the applicant's invention as claimed with the exception of providing a block that has a vertical axis and a horizontal plane formed by two axes, the first portion of the heat conduit extending generally along the horizontal plane, and the second portion of the heat conduit extending generally along the vertical axis.

Suzuki discloses a cooling system for electronic packages that does provide a block that has a vertical axis and a horizontal plane formed by two axes, the first portion of the heat conduit extending generally along the horizontal plane, and the second portion of the heat conduit extending generally along the vertical axis (see figure 2). Therefore it would be obvious to modify Hileman's invention by providing a block that has a vertical axis and a horizontal plane formed by two axes, the first portion of the heat conduit extending generally along the horizontal plane, and the second portion of the heat conduit extending generally along the vertical axis in order to increase the heat transfer process.

Referring to claim 19, Hileman discloses the applicant's invention as claimed with the exception of providing a second portion that has a shape selected from the group consisting of generally straight, generally S-shaped, and shaped as a loop.

Suzuki discloses a cooling system for electronic packages that does provide a second portion that has a shape selected from the group consisting of generally straight, generally S-shaped, and shaped as a loop (see figure 2). Therefore it would be obvious to modify Hileman's invention by providing a second portion that has a shape selected from the group consisting of

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generally straight, generally S-shaped, and shaped as a loop in order to increase the cooling process.

Referring to claim 21, Hileman discloses the applicant's invention as claimed with the exception of providing a block that has a first side edge, the second portion of the heat conduit a first distance from the first side edge, the first distance being a heat conduction distance of a first segment of the block, the first segment of the block to dissipate heat from the heat conduit.

Suzuki discloses a cooling system for electronic packages that does provide a block that has a first side edge, the second portion of the heat conduit a first distance from the first side edge, the first distance being a heat conduction distance of a first segment of the block, the first segment of the block to dissipate heat from the heat conduit (see figure 2). Therefore it would be obvious to modify Hileman's invention by providing a block that has a first side edge, the second portion of the heat conduit a first distance from the first side edge, the first distance being a heat conduction distance of a first segment of the block, the first segment of the block to dissipate heat from the heat conduit in order to increase the cooling process.

Claims 12, 13, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hileman US Patent No. 6,144,553 in view of Panek US Pub. No. 2003/0075312 A1.

Hileman discloses the applicant's invention s claimed with the exception of providing thermally conductive material that comprises a non-metallic material (polymer).

Panek discloses a structure and method of attaching a heat transfer part having a compressible interface that does provide thermally conductive material that comprises a non-metallic material (polymer) (see page3 left column 1st paragraph). Therefore it would be obvious

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to modify Hileman's invention by providing thermally conductive material that comprises a non-metallic material (polymer) to decrease the weight and the cost of manufacturing.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hileman et al. Us Patent No. 6,144,553 in view of McCullough US Pub. No. 2003/0056938 A1.

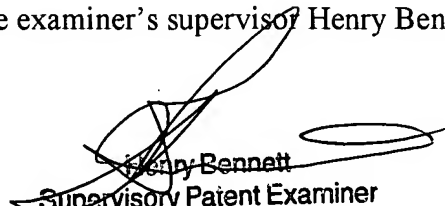
Referring to claims 2 and 3, Hileman discloses the applicant's invention as claimed with the exception of providing a first thermal conductivity that is greater than or equal to about 10 and less than or equal to about 100.

McCullough discloses a heat sink assembly with overmolded carbon matrix that does provide a first thermal conductivity that is greater than or equal to about 10 and less than or equal to about 100. Therefore it would be obvious to modify Hileman's invention by providing a first thermal conductivity that is greater than or equal to about 10 and less than or equal to about 100 in order to increase the heat transfer process.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Nihir Patel whose telephone number is (703) 306-3463. The examiner can normally be reached on Monday-Friday from 7:30am to 4:30pm. If attempts to reach the examiner by telephone are unsuccessful the examiner's supervisor Henry Bennett can be reached at (703) 308-0101.


Henry Bennett
Supervisory Patent Examiner
Group 3700

NP
November 26, 2003